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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.           | CONFIRMATION NO.       |
|---|-------------|----------------------|-------------------------------|------------------------|
| 10/706,842  | 11/12/2003  | Paul S. Andry        | YOR920010100US2<br>(8728-493) | 6927                   |
| 22150 7590 06/01/2007<br>F. CHAU & ASSOCIATES, LLC<br>130 WOODBURY ROAD<br>WOODBURY, NY 11797 |             |                      | EXAMINER<br>HON, SOW FUN      |                        |
|   |             |                      | ART UNIT<br>1772              | PAPER NUMBER           |
|   |             |                      | MAIL DATE<br>06/01/2007       | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/706,842

Applicant(s)

ANDRY ET AL.

Examiner

Sow-Fun Hon

Art Unit

1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 31-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31 and 34 is/are rejected.
- 7) ☒ Claim(s) 32-33,35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

***Response to Amendment***

***Withdrawn Rejections***

1. The 35 U.S.C. 112, 1<sup>st</sup> paragraph rejection of claim 19, and 35 U.S.C. 102(b) and 103(a) rejections of claims 15-19, 21-30, are withdrawn due to Applicant's cancellation of said claims.

***New Rejections***

***Claim Objections***

2. Claim 35 is objected to because of the following informalities: It should depend on claim 34 instead of claim 31 since claim 34 recites the non-rubbed SiO<sub>y</sub>N<sub>z</sub> alignment layer. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 31 is rejected under 35 U.S.C. 102(b) as being anticipated by Samant (US 6,061,115).

Samant teaches a liquid crystal display device (column 2, lines 65-67), comprising: a SiC<sub>x</sub> alignment layer, comprising silicon and carbon materials, wherein x = 1 (SiC, column 4, lines 1-5), and wherein the SiC<sub>x</sub> alignment layer is aligned by ion bombardment (column 4, lines 22-29), which means that it is non-rubbed as defined by

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Applicant's specification (treated with an ion beam to create a surface alignment layer, page 14, lines 3-10). Samant teaches that the alignment layer imparts a pretilt angle to the liquid crystal material disposed in contact with the non-rubbed alignment layer, of usually from about 1 to 6 degrees (column 6, lines 42-45). Thus, the constituent materials of the non-rubbed  $\text{SiC}_x$  alignment layer inherently has a predetermined stoichiometric relationship that imparts a predetermined pretilt angle to the liquid crystal material based on an amount  $x$ , of the constituent carbon material, wherein  $x = 1$  in this case.

***Claim Rejections - 35 USC § 103***

4. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Samant (US 6,061,115) in view of Kaganowicz (US 5,011,268).

Samant teaches a liquid crystal display device (column 2, lines 65-67), comprising: an alignment layer, that can comprise  $\text{SiO}_y$ , wherein  $y = 2$ , and  $\text{SiN}_z$ , wherein  $z = 1.3$ , and thus can comprise constituent silicon, oxygen and nitrogen materials ( $\text{SiO}_2$ ,  $\text{Si}_3\text{N}_4$ ,  $4/3 = 1.3$ , column 4, lines 1-5), and wherein the alignment layer is aligned by ion bombardment (column 4, lines 22-29), which means that it is non-rubbed as defined by Applicant's specification (treated with an ion beam to create a surface alignment layer, page 14, lines 3-10). Samant fails to teach that the constituent silicon, oxygen and nitrogen materials are combined to form a  $\text{SiO}_y\text{N}_z$  alignment layer.

However, Kaganowicz teaches that a  $\text{SiO}_y\text{N}_z$  alignment layer can be formed (silicon oxynitride, column 4, lines 55-65), for the purpose of a imparting a pretilt angle

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to the liquid crystal material in contact with the  $\text{SiO}_y\text{N}_z$  alignment layer (tilt angle, column 3, lines 10-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have combined the constituent silicon, oxygen and nitrogen materials of Samant, to form a non-rubbed  $\text{SiO}_y\text{N}_z$  alignment layer, in order to impart the desired pretilt angle to the liquid crystal material that is in contact with the alignment layer, as taught by Kaganowicz.

The constituent materials of the non-rubbed  $\text{SiO}_y\text{N}_z$  alignment layer, of Samant in view of Kaganowicz, inherently have a predetermined stoichiometric relationship that imparts a predetermined pretilt angle to the liquid crystal material based on the amounts, y and z, of the respective constituent oxygen and nitrogen materials.

### ***Allowable Subject Matter***

5. Claims 32-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest cited prior art of record, US 6,061,115, fails to teach or suggest, a liquid crystal display device, comprising: a non-rubbed  $\text{SiC}_x$  alignment layer, comprising constituent silicon and carbon materials; and liquid crystal material disposed in contact with the non-rubbed  $\text{SiC}_x$  alignment layer, wherein the non-rubbed  $\text{SiC}_x$  alignment layer imparts a pretilt angle in a range of about 4 to about 5 degrees when x is set to about 2, or a pretilt angle in a range of about 0.5 to about 1 degree when x is set to about 1.5. The reference does not have sufficient

specificity and fails to provide motivation to set  $x$  to about 2 to impart a pretilt angle in the range of about 4 to about 5 degrees; or to set  $x$  to about 1.5 to impart a pretilt angle in the range of about 0.5 to about 1 degree.

6. Claim 35 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest cited prior art of record, US 6,061,115, fails to teach or suggest, even in view of US 5,011,268, a liquid crystal display device, comprising: a non-rubbed  $\text{SiO}_y\text{N}_z$  alignment layer, comprising constituent silicon, oxygen and nitrogen materials; and liquid crystal material disposed in contact with the non-rubbed  $\text{SiO}_y\text{N}_z$  alignment layer, wherein the non-rubbed  $\text{SiO}_y\text{N}_z$  alignment layer imparts a pretilt angle in a range of about 0 to about 1 degree by adjusting  $y$  and  $z$ . The combination of references do not have sufficient specificity and fail to provide motivation to set the pretilt angle in a range of about 0 to about 1 degree since '268, which compensates for the failure of '115 to teach the  $\text{SiO}_y\text{N}_z$  alignment layer, teaches that the tilt angle should be between 1 and 5 to provide a suitable response time and to optimize the viewability of the device (column 1, lines 50-55), thus teaching against the range of about 0 to about 1 degree.

***Response to Arguments***

7. Applicant's arguments with respect to claims 15-19, 21-30, have been considered but are moot in view of Applicant's cancellation of said claims.

***Conclusion***

8. Applicant's amendment canceling the previously presented new claims and presenting new claims, necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

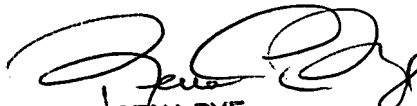
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Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon.  
Sow-Fun Hon  
05/18/07

  
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